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ROYAL EXCHANGE.

This elegant building, which stands on nearly the highest ground in the city, in a central situation, may be considered as one of the greatest ornaments of our metropolis. It is situated on Cork-hill, immediately adjoining the Castle gate, and has in front one of the longest avenues in Dublin, comprising Parliament-street, Essex-bridge, Capel-street, Bolton-street, and Dorset-street. Owing to the narrowness of Parliament-street, not more than half the building can be seen from that point.

It forms a square of 100 feet, crowned by a dome in the centre, and has three fronts, all of Portland stone. The north, or principal front, has a portico of six Corinthian columns (these at the extremities coupled,) whose entablature is continued along the three fronts, all of which are decorated with Corinthian pilasters, with festoons, &c. between the capitals. The top of the building is crowned by a balustrade, except where it is interrupted by the pediment on the north side; and above this, the summit of the dome is visible, but having no tambour it is too low to be distinctly seen. As the situation is on an exceedingly steep hill, the approaches are somewhat interrupted: that to the principal front is at the western end, where the terrace is level with the street; but the other end of this platform, or terrace, is blocked up by a high wall, surmounted by a heavy iron railing of enormous height, greatly disfiguring the front of this light and elegant structure.

This was not part of the original design, but in consequence of the sudden ascent of the ground, the architect continued the terrace, which was accessible at the east by a long and wide flight of steps, the west end being level with the street; the terrace was protected by a metal balustrade resting on rustic work. On the 24th of April, 1814, a crowd having assembled on this platform, to witness the whipping of a criminal, the balustrade yielded to the pressure, and numbers were precipitated into the street. The principal sufferers were those who stood below, some of whom were killed upon the spot, and many dreadfully bruised. Beneath the colonnade are three large iron gates, suspended on Ionic pilasters; these lead into a flagged hall, where are the entrances to the Exchange-hall. Over the gates and between the pillars are windows ornamented by architraves, lighting the coffee-room. On either side of the portico are two corresponding windows, resting upon a rich fluted impost or facia, that serves as a cornice to the ground floor, which is rusticated and unperforated by any aperture, a circumstance that gives a peculiar and appropriate character to this structure, while it adds greatly to its strength.

The western elevation does not differ much from that on the north, except that the portico has only four columns and no pediment; and that there is only one window on each side, in the inter-pilaster adjoining the portico, the other being without any aperture whatever. The east front, which is in Exchange-court, has only pilasters: on this side are the entrances to the vaults of the Exchange, which are dry and extensive, and are generally let to the Commissioners of Customs, who frequently want more storage than the buildings attached to the Custom-house afford.

The ingenuity of Mr. Cooly is no where more conspicuous than in his design of the interior of the Exchange: the ground plan may be perfectly represented by the idea of a circle inscribed in a square, but the beauty and elegance of the effect produced, cannot be so readily represented by description.

Twelve fluted columns, of the Composite order, thirty-two feet high, form a rotundo in the centre of the building. Above their entablature, which is highly enriched, is an attic ten feet high, with as many circular windows, answering to the inter-columns below, and connected with pendant festoons of laurel in rich stucco work, and from this rises an elegantly proportioned dome, ornamented with hexagonal *caissons*. This is deservedly considered a chef-d'œuvre in the art of stucco plastering, and was executed by the late Alderman Thorpe of this city. In the centre of the *crown* is a large circular sky-light, which, with the assistance of the different windows, judiciously dispersed around the hall, affords a profusion of light.

The inter-columns are open below to the ambulatory encompassing the circular area in the centre of the building. Ionic impost pilasters, about half the height of the columns to which they are attached, support a fluted frieze and enriched cornice, above which, in the upper spaces of the inter-columns, are pannel and other ornaments. The ambulatory is much lower than the rotunda, being covered with a flat ceiling, the height of the impost pilasters, with enriched soffits, extended from these pilasters to others opposite to them against the wall. Between the pilasters are blank arcades with seats.

Between two of the columns, immediately opposite the north or principal entrance, is a statue, in bronze, of his late Majesty, George III, standing on a pedestal of white marble, dressed in a Roman military habit, and holding a truncheon in his right hand, of which we shall give an engraving in our next number. This statue, the workmanship of Van Nost, was a gift of the Earl of Northumberland, Lord Lieutenant, (who paid the artist seven hundred guineas,) to the merchants of this city, for the Royal Exchange. Over the statue of his late Majesty, in one of the pannels beneath the entablature, is a handsome clock. Behind the four columns, which are opposite the four angles of the exterior wall of the building, desks are placed in the small angular recesses formed at the meeting of the tangents to the circular hall, which are not only convenient to the merchants, but contribute to square the exterior ambulatory, and to preserve an equal breadth in the entire length of the walk, at every side.

Both the circular hall and ambulatory are paved with square flags, alternately black and white, and gradually diminishing in breadth to the centre of the circle. The ambulatories are lighted by the doors of the north, east, and west sides, which are half glazed. At the eastern and western ends of the north front, are handsome oval geometrical stair-cases, with ornamented balustrades, lighted by lanterns inserted in a coved ceiling, the lanterns being the precise diameter of the central well of the staircase. On the stairs, in the north-western angle, is a beautifully executed statue of Dr. Lucas, of which, with a statue of Henry Grattan, which stands in the Hall, we purpose giving engravings in some future numbers.

This staircase leads to the Coffee-room, the Court of Bankrupt Commissioners, &c. The Coffee-room is immediately over the entrance on the north, and the other apartments are over the ambulatories.

The ceilings of those staircases are richly decorated with stucco-work; and in some of the compartments are casts of several figures found in the ruins of Herculaneum, which, being laid on coloured grounds, are distinctly seen.

On the 2d of August, 1769, the first stone was laid by Lord Townsend, the then Lord Lieutenant, and in ten years from that date, the Exchange was opened for the transaction of business.

MEETINGS OF THE BRITISH ASSOCIATION.

In the Zoological and Botanical Section, on Thursday, Mr. Mackay presented the following paper on Phœnogamous Plants and Ferns indigenous to Ireland, which are not found in England or Scotland.

PLANTS AND FERNS INDIGENOUS TO IRELAND.

Erica mediterranea, E. B. Sup.—First found on Erris-beg mountain, near Roundstone, Cunnemara, Oct. 1829. It has since been observed by Mr. Wynne, jun. of Hazle wood, and other gentlemen in the wild district of Erris. It is a distinct variety from the plant cultivated in gardens under the above name.

Menziesia Polifolia—Plentiful throughout Cunnemara and the mountainous districts of Mayo. A beautiful variety with white flowers is occasionally met with, which is now highly esteemed in collections.

Arenaria ciliata—On the Limestone rocks of Ben Bulben and other mountains of Sligo, where it was first found in October 1806.

Arabis ciliata—On the sea shore near Renvyle, Cunnemara, and other places along the coast, in Oct. 1806. It has subsequently been found by Mr. James Drummond, on the western coast of Kerry.

Saxifraga umbrosa, E.B.—Woods at Glengariff, near Bantry.
β *Hooker*—On the summit of Curan Tuthol, the highest of Magillycuddy's Reeks, and on the Galway, Mayo, Sligo, and Donegal mountains.
Dr. Barker has also observed it growing plentifully on the Waterford mountains.
γ. *Hooker. Robertsonia serrata, Haworth.* Gap of Dunloe, 1805, and there only. A very distinct variety, or perhaps a distinct species.

Saxifraga Geum, Linn. and Hooker—Leaves hairy on both sides. On rocks by the rivulet below Turk waterfall, in Oct. 1805.
β. *Hooker*. E. Bot. t. 1561—On the cliffs of Mangerton, Priest's Leap, and other Mountains in Kerry and Cork, abundant.
γ. *Hooker*, *Robertsonia polita, Haworth*, Conner Cliffs, near Dingle.
δ. *Hooker*, *Saxifraga elegans*, Mackay MSS.—On a rock on the summit of Turk mountain, Killarney, in 1805.
ε. *Hooker*, *S. gracilis*, Mackay MSS. Conner Cliffs, 1805.

Saxifraga hirsuta, Linn.—Gap of Dunloe, 1805.

Saxifraga lævis, Mackay MSS. summit of Brandon, county of Kerry, 1805.

Saxifraga incurvifolia, Don. summit of Brandon with the last

Saxifraga hirta, E. Bot. t. 2291, figure excellent. On rocks in mountain streams, on Magillycuddy's Reeks, County of Kerry, and Galtymore, County of Tipperary, in 1805-6.

Arbutus uncdo—Plentiful at Mucruss and other places near Killarney, and at Glengariff, near Bantry. Mr. Drummond found it in elevated situations in the wild district of Ivragh, and hence supposes it to be truly indigenous.

Rosa hibernica, E. Bot. t. 2196—Counties of Down and Derry, Mr. Templeton. Mr. D. Moore has lately found it in the latter county in a truly wild situation. It grows in hedges on the shore below Belfast.

Rosa Sabina—A new variety of this species was found in the County of Derry, by Mr. Moore Botanist to the Ordrance Survey, in the autumn of 1834.

Hyperioum Calycinum—Mucruss woods, Killarney, 1805, perhaps introduced. The Rev. Dr. Hincks, who subsequently found it near Cork, in company with Mr. J. Drummond, and sent it to the late Sir J. Smith, now thinks that it must have escaped from a garden in the situation where he found it.

Ulex Strictus—This upright variety of the Ulex Europœus was found in the Marquis of Londonderry's park, County of Down, about thirty years ago, by Mr. John White; it seldom flowers, but is readily propagated by cuttings, and makes a neat hedge for sheltering tender plants.

Neottia gemmipāra, Smith, Engl. Fl. v. iv. p. 36.—This rare orchideous plant was found by Mr. J. Drummond, sparingly in marshes near Bantry Bay, about twenty years ago, but no one has since found it.

Taxus Hibernica—This very distinct variety of yew, if not a distinct species, is found apparently wild in the woods of Florencecourt, the seat of the Earl of Enniskillen. Fine specimens in a cultivated state are to be seen at Comber, and near to the town of Armagh.

Equisetum Drummondii, Hooker, Br. Fl. ed. 2, p.—First found by Mr. Thomas Drummond, on a moist bank, near Cave-hill, Belfast, where I have since gathered it in company with Mr. Wm. Thompson, and Mr. Francis Whitla.

Trichomanes brevisetum, Eng. Bot. t. 1417—(Hymenophyllum alatum)—First found in fructification on a moist bank, near the Waterfall, between Turk and Mangerton Mountains, Killarney, in October 1805, and subsequently in the same state by John Nuttall, Esq. of Tittour, County of Wicklow, in Hermitage Glen in the same county. Barren fronds of this interesting fern had been previously found in England.

Note.—*Ammi Majus*, which I inserted in my Catalogue of Irish plants, was found at Portmarnock, in 1821, by Mr. E. Murphy and myself, but as the ground has since been ploughed up, and the plant destroyed, it cannot now have a place in our Flora.

Clypeola Jonthlaspi, Mackay's Cat. *Alyssum minimum*, which I have, since publishing it, found it to be, is still to be found very sparingly on a sandy ditch bank at Portmarnock, but has, as well as the last, been probably introduced.

METHOD OF MAKING PAPER FROM TURF.

In the Chemical and Mineralogical Section, on Friday, Mr. Robert Mallet read a paper on the preparation, from certain varieties of turf or peat, of a white fibre or pulp, for the purpose of making paper, and of certain pigments, resulting as useful educts from the process. He stated, that a substitute for rags (the usual material for paper making) was wanted, owing to their cost, government duty, &c.; that various attempts had been made to find one, but without obtaining the conditions to be desired. He exhibited to the Section, specimens of paper made from straw; Chinese paper, made from the outer coats of a species of amaryllis; French white paper, made from old rope and oakum; and English letter paper, containing a large quantity of plaster of Paris; and mentioned that chopped hair, spent bark, wool combings, cotton flyings, curriers' shavings, and even common wood shavings, had been tried as materials for paper making. None of these are found to answer on investigation, therefore it appeared to Mr. Mallet that the confervæ of our fresh waters, or certain kinds of turf, might afford a pulp fit for use. The former was soon found to be too fragile to endure bleaching; but from the latter, after some experiments, a pulp was procured fit for making good white paper, either alone or in combination with that from rags. Specimens of this pulp, as perfectly white as that from the best rags, were exhibited to the Section.

"It is well known that peat bogs, and especially our Irish ones, consist of various strata, differing in density and other properties in proportion to depth. The surface of the bog is usually covered with living mosses, heaths, and various paludose plants; and the stratum immediately beneath, usually consists of a tough, fibrous, light, spongy mass, varying in thickness from a few inches to some feet, and composed of the parts of the same kind of plants which are growing on its surface in the first stage of decomposition. It is of a deep red brown, contains the vegetable fibres nearly unaltered, while the other organic substances of the plants are chemically changed; and the whole is, as to chemical condition, nearly in the state of some of the "papyri" found at the Herculaneum.

The process for producing from this crude material a white pulp for paper is as follows. The red turf when cut is macerated by machinery nearly similar to the ordinary rag engine, until its parts are fully separated, but without bruising or injuring its fibre; and a stream of water, running through the machine, carries off all the pulverulent, and mixed earthy matter.

"The mass is next dried by pressure in the hydraulic press, and all strong woody stems of heath, &c. contained in it, separated by winnowing or other suitable means.

"The fibres of the minute plants—the mosses, grasses, &c.—now reduced to a uniform size, and placed in a very dilute solution of caustic potass or soda, containing not more than sixty grains of alkali to a quart of water; for this purpose Mr. Mallet prefers the "black potash" of commerce, which is a mixture of carbonate and caustic potass. After sufficient exposure to this agent, the mass is again pressed to dryness, and then thrown into an exceedingly dilute sulphuric acid, consisting of fifty grains acid of commerce to a quart of water. By the action of the alkali, nearly all the soluble matter, consisting chiefly of ulmin, or geine of the Continental chemists, is removed in solution; and the fibre, which was of a deep red brown, comes out a light fawn colour; and by the dilute acid, the minute quantity of iron, lime and alumine, &c. existing in it, is carried, together with ammonia when it exists; and the last remains alkali are neutralized. The fibre, after sufficient time, is again pressed dry, and, finally, put into a dilute solution of chloride of lime or bleaching liquid; this, after some time, brings the fibres into the state of a pure, white, fine pulp, which is pressed from the solution, washed in pure water, and used either alone or in combination with fibre from rags, for the ordinary purposes of the paper maker.

The alkaline solution, from which the fibre has been separated, consists chiefly of an impure geinate of potass or soda, whichever has been used. Dilute sulphuric acid is added to this, which takes up the alkali and the geine precipitates; it is separated by filtration, and dried by a steam or water bath.

The pigment called "Vandyke brown" has long been known to painters, both in oil and water colours, as a durable and rich colour; the dry precipitate thus obtained is, in fact, this very pigment, in its purest and most splendid state. When once dry, it ceases to be soluble in water, and, consequently, is not deliquescent, but it is miscible readily with gum, mucilages, size, or oils.

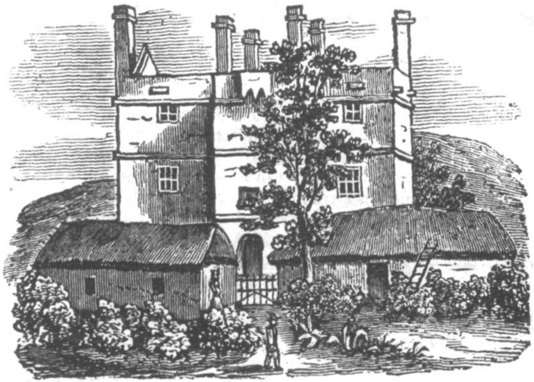
The quantity of alkali used in this process is small, but, if found worth while, its combination with the acid may be made available in commerce.

After the turf fibre has been for a time exposed to the action of the chloride of lime in excess, in some cases a resinous looking film appears on the surface of the fluid; by operating on a large quantity, and careful management. this may be separated, and is found to be a composite substance, consisting of a species of artificial camphor, of a gum resin, and of an essential oil.

It seems probable, that the first is produced by the action of free chlorine on some minute quantity of turpentine, contained in the turf: and it is a curious fact, that chemistry should thus, as it were, recal to observation, and decompose, the turpentine of plants, which have ceased to exist as living vegetables, perhaps for centuries. The properties of this substance have not been strictly examined, owing to the small quantity in which it is procured; it is ascertained, however, to be a compound, as its boiling point changes during its volatilization. Its specific gravity is about that of common camphor—it is insoluble in water—soluble, to a considerable extent, in alcohol, and the remainder is soluble in proof spirit, appearing to be a gum resin; it does not wholly dissolve in caustic alkalies; strong sulphuric acid converts it into charcoal, and a substance analogous to artificial tannin. It is also partly soluble in volatile and fixed oils, and from the former it crystallizes on evaporation.

Specimens of the white pulp of the bistre, or brown pigment, and of the artificial camphor, were exhibited by Mr. Mallet. The pulp is fully equal, in appearance, to that from the best fine rags, and nearly as tough in fibre; about eighteen pounds of it may be procured from one hundred weight of crude turf. Mr. Mallet also exhibited specimens of a new description of board paper, or millboard, for engineers' use, prepared from this variety of turf, by an exceedingly simple process. The turf, whose fibres lie naturally very nearly parallel, is cut of the required size, about two feet square, by three inches thick; when dry, it is placed in a close cast-iron vessel, the air exhausted, and a mixture of dissolved glue and molasses, at a boiling heat, poured over it, which fills up all the pores; the turf is then removed, while hot, and subjected to the pressure of an hydraulic press, by which the superfluous fluid is expressed, and its substance condensed to about three-eighths of an inch in thickness; in this condition it is strong, tough, flexible, and fit for all the uses of common board paper; it is not injured, nor is it permeable by high pressure steam. Various other materials may be used for filling the pores, as boiling coal tar, fat oils, wax, paints, &c.; this would appear to open a most valuable manufacture.

It is worthy of remark, that the kind of turf suited for all the above purposes is precisely that which is the worst possible as fuel, by a singular, natural, but coincident adaptation; there is reason, therefore, to hope that, owing to these and other discoveries, the time may arrive when the bogs of Ireland will be better valued than they have been—when art will show them to be magazines of the richest manure—to be, when properly prepared, a fuel scarcely inferior to coal—and to produce the materials for paper and colours; instead of being looked upon as the blot upon her fair and fertile champaign, they may become the reservoir of her riches, and the residences of her manufacturing industry.



E. Heyden, del.

RUINS OF IMMOKILLY CASTLE.

The town, or rather village, of Castlemartyr differs very materially from most of the little towns and villages in the South of Ireland, as presenting an appearance of cleanliness and comfort not frequently observable elsewhere. It consists principally of one long street, apparently terminated by the venerable entrance to the noble demesne of the Earl of Shannon, to which access may be had on proper application. The house is not, indeed, very prepossessing in its appearance, being rather old and somewhat in the Grecian style, and must (from its situation) be seen at too short a distance to have that imposing effect which it would have if viewed farther off. The extensive demesne exhibits at once almost every variety of nature—the wood appears to great advantage, and it is evident was originally intended more for a display of natural beauty than for economy; whole herds of deer are seen in every quarter, and of almost every colour. The beauty of the demesne is still further improved by a circuitous canal, which is, in many places, ornamented by rustic and other fancy bridges, near splendid cascades; the intermediate sheet of water is at all times stocked with abundance of aquatic birds of various species, whose nature seems changed, from the frequency of visitors, particularly during the summer months. The gardens, which are attached to the demesne, contain every variety of fruits and flowers peculiar to that province, and are, undoubtedly, laid out with the most classic taste.

A road from the town, bounded on one side by the demesne, and overshadowed by lofty elms, leads on to Lady's Bridge—on a summer's evening, a most fashionable and agreeable rural promenade. From this may be seen, finely situated, the ruins of Immokilly Castle, distant somewhat more than one mile from the town. Neither its external or internal appearance at present possess many marks of feudal grandeur, or of skill or taste in that style of architecture by which we so easily distinguish the invulnerable fortress of its date of origin, as appears from an inscription on a chimney-piece, which ornaments the fire-place of one of the principal rooms, and which I copied verbatim—

EDMVNDVS SVPPEL DOMINVS MARGRITAQVE GERALD
HANC STRVXERE DOMVM QVO SLIGATVNVS AMOR
1641

E. H.